

DEVELOPMENT OF SHOCK ABSORBING LOOP WHEEL

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ABSTRACT

The purpose of our project was to reduce shocks on uneven roads, improve shock Absorption & take a smooth ride. Loop Wheel is a suspension system, Built to Experience smooth ride on uneven road by reducing shocks! So we replaced Spokes by 3 carbon springs. If we are riding on uneven road, the spring can move in between Hub and Rim. As its gone pass by a bump or bad road then the spring which is been touched to the surface will get compressed and others get expand! So the whole impact power gets distribute in the wheel and the rider will feel nothing about that impact. So basically it will feel rider like he's driving his cycle on the flat and smooth road. Therefore we don't need jumpers.

Keyword: - loop wheel, suspension system, shock absorber etc.

1. INTRODUCTION.

A loop wheel is a wheel with integral suspension, designed for better shock Absorbing performance and greater comfort. Loop wheel give you a smoother ride. From this wheel, we can easily ride our bike on uneven road. For the batter shock Absorption we changed spokes with the group of 3 carbon spring. In this wheel used springs are made by carbon composite Material. The Group of carbon spring is fixed in between Rim and Hub. By the carbon spring rider can take a smooth ride.



Figure 1: Block diagram of loop wheel

1.1 How Loop Wheels Are Different From Spock Wheels

A loop wheel doesn't have the rigidity and stiffness that's necessary in a spoke wheel. The spokes on a normal wheel hold it in tension: if the spokes lose tension, they start to break and the rim may buckle. A Loop-wheel is not held in tension by its springs – the rim is strong and doesn't suffer from buckling. You don't need to tune any spokes, either!



Fig No. 2: Spoke Wheel

A loop wheel doesn't run as true as a spoke wheel, both on and off your bike or wheelchair, and there is slight lateral movement. As soon as the springs are loaded, they compress and further change their concentricity. This is what gives you comfort and shock absorption. A spoke wheel will be more rigid and if tuned correctly will run truer than a loop-wheel – but it won't provide shock absorption like the loop-wheel does.



Fig. No. 3: Loop wheel

2. WORKING PRINCIPLE

In our routing life, we are using the spoke wheels. But on uneven road the spoke wheel's shock Absorption is very low and rider can feel it. The solution of this problem we prepared a loop wheel. The three loops in each wheel work together as a self-correcting system. The strips system between the hub and the rim of the wheel provides suspension that constantly adjusts to uneven land and potholes in the road. In effect, the hub floats within the rim, adjusting constantly as shocks from an uneven road hit the rim of the wheel. The strips configuration allows the torque to be transferred smoothly between the hub and the rim. Each wheel incorporates a regular hub, with a hub brake and hub gearing. Instead of spokes, however, three looped carbon composite springs run from the hub to the rim. Whenever the wheel hits a bump. in the road, the energy is absorbed by those spring.

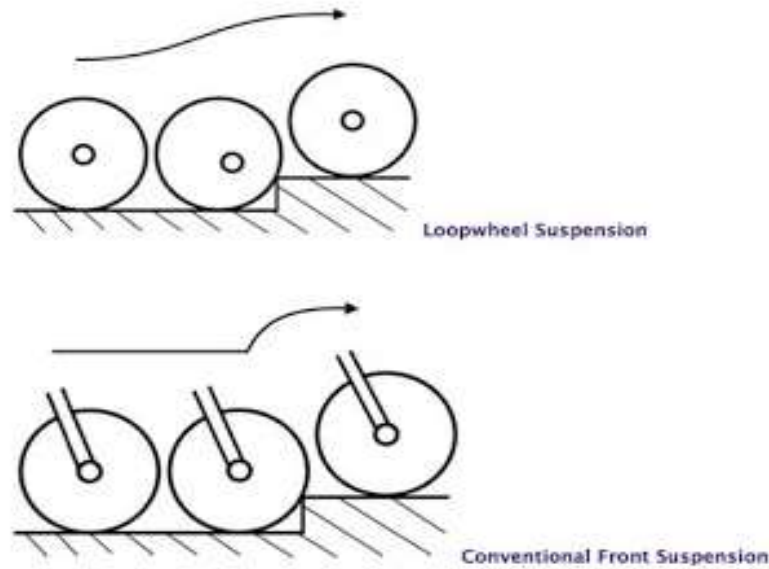


Fig. No.4. Working Principle

2.1 Procedure

First of all we have prepared the drawing of Loop wheel. As you can see the above Figure first of all we purchased a tyre, Rim, hub a group of 3 carbon spring, clamp, Axel, hub connectors. etc. After that we attached the tyre and rim then we attached hub and hub connector to connect hub and Rim with carbon spring we used clamps. The carbon spring can be move in between hub and rim according to the load on tyre. And finally we get the required condition loop wheel.

4.3 Manufacturing Process

First of all for manufacture the loop wheel we need to manufacture the different parts and then we will Assemble it for the Final Product.

Step 1 (Rim):-To manufacture Rim we performed spinning operation. Then the Drilling operation to assemble the rim with carbon springs.

Step 2 (Carbon Springs):- Carbon Spring is having elasticity property an have the spring action. To get spring action first we need to cut it in 3 parts and then we create the loop shape by performing Bending Operation.



Fig. No.5 Carbon Spring and Rim Assembly**Fig. No. 6 Carbon Spring**

Step 3 (Hub):- To Manufacture the Hub First We need a round bar as a raw material. Then we should Turning operation to get a perfect diameter of Hub. Next we need to drill And Boar it to fit Axle in Hub.

Step 4 (Triangle Hub):- To manufacture the Triangle Hub First we cut the 3 Strips and Weld it on the Hub and make a Triangle shape.

**Fig .No. 7 Triangular Hub**

Step 5 (Axle):- It's special type tire so we need to manufacture a special Axle for it. To manufacture Axle for we should perform turning operation and then create threads for nut bolting.

Step 6 (Assembly):- After the parts manufactured we will assemble it. To Fix Carbon Spring, Rim and Triangular Hub we use Nut and Bolts. These are the steps for manufacture the Loop Wheel.

**Fig No. 8 Loop Wheel (Final Product)**

3. OVERVIEW

3.1 Used Material

The wheel has many components and they have the different materials in different component. List of wheel component and their material as shown below.

Wheel Component	Material
1. Wheel Rim	Aluminium
2. Hub	Aluminium
3. Spring	Carbon

3.2 Advantages

- Loop wheel are different from spoke wheels. They look, feel and perform differently. You will be used to a wheel being a rigid thing, Loop wheel have flexibility in them in order to provide shock absorption and suspension.
- They are more comfortable than standard wheels, the rubber strips absorb tiring vibration, as well as bumps and shocks.
- Loop wheel provide tangential suspension, meaning they work in every direction.
- In a loop wheel the hub moves within the rim; the spring's flex. the whole wheel acts as a flexible moving system which constantly adjusts to the load it carries.
- In a Loop wheel the Rubber strips configuration allows the Torque to be transferred smoothly between the Hub and The Rim. For maximum comfort over bumps and less vibration from the road.
- The spokes on a normal wheel hold it in tension: if the spokes lose tension, they start to break and the rim may buckle. A Loop wheel is not held in tension by its spring –the rim is strong and doesn't suffer from buckling.

3.3 Limitations

- The rubber strips used in loop wheel is a composite material with a high cost compare to conventional spokes.
- Loop Wheel can't be used in bikes, cars and heavy vehicles.

4. CONCLUSIONS

The project is to increase shock- Absorption and better suspension of the bicycle wheel. Loop wheel are designed to help you push over uneven streets, cobbles, grass, rough tracks and gravel paths with less effort. The composite rubber strips give you extra power to get up or down kerb. These wheels are useful for Handicap's wheel chairs and the mountain bike for the smooth ride.

5. REFERENCES

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